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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/134,272	08/14/1998	ZIFEI PETER WANG	003239.P010	7801

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EXAMINER

ARMSTRONG, ANGELA A

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 02/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/134,272

Applicant(s)

WANG, ZIFEI PETER

Examiner

Angela A. Armstrong

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-6,9,11,12,15-17 and 22-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-6,9,11,12,15-17 and 22-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4, 6, 9, 11-12, 15-17, 22-23, and 25-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Polcyn et al.* (US Patent No. 5,311,588) in view of *Modi et al.* (US Patent No. 6,125,345) in further view of *Xie* (US Patent No. 5,841,385).
3. Regarding claims 4, 6, 9, 11-12, 15-17, 22-23, and 25-37, *Polcyn et al.* discloses a method and system for determining the progress of a calling connection by determining signal transitions from tone to silence, silence to speech, etc. In the Abstract, at col. 1, lines 59-66 continuing to col. 2, lines 1-33, col. 7, lines 49-67 continuing to col. 8, lines 1-25, col. 16, lines 20-37, and col. 16, lines 49-62 *Polcyn et al.* suggests/teaches a method of calculating a first ratio level of said audio signals and an average power level of signals (determining a peak-to-mean ratio) and comparing...ratio levels to a set of criteria to determine the line status (comparing the peak-to-mean ratio to a selected threshold to determine whether a frame represents a voice signal). At col. 2, lines 21-22 *Polcyn et al.* teach that an essential feature of the invention is determining the difference between noise and a voice.

*Polcyn et al.* does not disclose that the ratios used in the detection method are normalized. However, refer to *Modi et al.* who teach a system, which uses confidence measures

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for performing classification and verification. *Modi et al* teach confidence measures of likelihood scores and likelihood ratios at col. 4, lines 15-16. At col. 9, lines 32-36, *Modi et al* teach normalizing the confidence scores based on their dynamic ranges. As such, the claimed normalization calculations using the maximum averaged minus minimum averaged peak-to-mean ratio for the current audio frame constitutes dynamic range normalization.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of *Polcyn et al* to normalize the peak-to-average ratios for the purpose of providing verification of the noise/voice determination as suggested by *Modi et al*.

The combination of *Polcyn* and *Modi* does not teach using short-term averaged energy, long-term averaged energy, etc., in the voice/speech detection process. However, refer to *Xie* who discloses a system and method which implements a voice activity detector for an audio system which calculates long-term average energy and short-term average energy and determines if a ratio of the two exceed a threshold value (col. 3, lines 34-59; col. 5, line 20-col. 7, line 65). *Xie* teaches the system more accurately estimates the average energy of the signal, which advantageously makes the system more stable and enables the voice activity detector to more accurately distinguish between noise and voice activity (col. 3, lines 45-49).

Therefore, it would have been obvious to one of ordinary skill at the time of invention to modify the system of *Polcyn et al* and *Modi et al* to implement the averaged energy determinations and calculations, as taught by *Xie*, for the purpose of more accurately estimating the average energy of the signal, so as to make the system more stable and enables the voice activity detector to more accurately distinguish between noise and voice activity, as taught by *Xie*.

4. Claims **5 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Polcyn et al*, in view of *Modi et al*, and *Xie* as applied to claims 6 and 22 above, and further in view of *Janiszewski et al.*, (US Patent No. 5,657,422).

5. Regarding claims **5 and 24**, “conducting weighted average,” it is noted that *neither Polcyn et al*, *Modi et al*, nor *Xie* disclose weighted averages. *Janiszewski* discloses a voice activity detection system that estimates energy and noise of a signal. Specifically at col. 6, lines 1-8 *Janiszewski* disclose using a smoothing constant in calculating signal estimates and setting the smoothing constant to provide for acceptable frame averaging.

Therefore, to the extent that neither *Polcyn et al*, *Modi et al*, nor *Xie* disclose weighted averaging, it would have been obvious to one of ordinary skill at the time of invention to modify the voice detection of system of *Polcyn et al*, *Modi et al*, and *Xie* to conduct a weighted average by using a smoothing constant for the purpose of providing acceptable frame averaging as taught by *Janiszewski et al*.

#### ***Response to Arguments***

6. Applicant's arguments filed September 16, 2004 have been fully considered but they are not persuasive.

7. Applicant argues that the combinations of *Polcyn*, *Modi*, *Xie* as well as *Polcyn*, *Modi*, *Xie*, and *Janiszewski* constitute impermissible hindsight reconstruction. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper

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hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant argues none of the references provide motivation for determining a peak-to-mean likelihood ratio or using both short-term and long-term averaged energies as set forth in claims 6, 12, 15, and 22. Applicant further argues since neither Polcyn and Modi discloses or suggest a peak-to-mean likelihood ratio, and Xie teaches away from using both short-term and long-term averaged energies, there is no motivation to combine the references in rejecting independent claims 6, 12, 15, and 22. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Modi teaches a system, which uses confidence measures for performing classification and verification and Xie provides a system and method which implements a voice activity detector for an audio system which calculates long-term average energy and short-term average energy and determines if a ratio of the two exceed a threshold value, and specifically teaches the system more accurately estimates the average energy of the signal, which advantageously makes the system more stable and enables the voice

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activity detector to more accurately distinguish between noise and voice activity. Thus, one of ordinary skill in the art of speech signal processing would recognize the advantages of implementing the teachings/suggestions of Modi to provide verification of the noise/voice determination to ensure the system is accurately detecting speech. One of ordinary skill in the art of speech signal processing would also recognize the advantages of implementing the long-term and short-term averaged energies of Xie, since Xie specifically teaches the energies improve the performance of the voice activity detector.

Applicant argues Xie teaches away from the claimed invention because Xie does not teach using both of the long-term and short-term averaged energies together. Applicant also argues Xie discloses computing long-term and short term energies for gain control purposes, not to detect voice activity. The Examiner disagrees and argues at col. 7, lines 27-40, Xie specifically teaches the voice activity detector (30) receives the long-term energy average output and the short-term energy average output and uses both energies in comparison with a silence time threshold (which reads on “the factor”).

Applicant argues Polcyn’s PAR is not the peak-to-mean likelihood ratio as recited. Applicant also argues Modi’s likelihood ratio represents probabilities of hypotheses, not related to sampled signals in an audio frame. Applicant further argues Xie does not teach using both of the long-term and short-term averaged energies together. Applicant also argues Xie discloses computing long-term and short term energies for gain control purposes, not to detect voice activity. Applicant also argues Janiszewski’s noise estimate is not based on the current audio frame and the prior audio frame. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the

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rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

***Conclusion***

**8. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Angela A. Armstrong  
Examiner  
Art Unit 2654

AAA  
February 22, 2005

*Angela Armstrong*